Abstract Algebra

Spring 2020

Course no. 4301.010
Instructor Trey Smith
Time MWF: 10:00-11:00
Location MCS 211
Office MCS 219A
Hours MTWRF : 11:00-12:00, 2:00-3:00
Others by Appointment
Phone (325) 486-5441
Email trey.smith@angelo.edu
Fax (325) 942.2503

Grading Your grade will be determined using your homework/quiz grade, three tests, and a final exam. The homework/quiz grade will count as bonus points (see homework below), and each test will count as 1/3 of your final grade subject to your score on the final exam. The final exam will serve to determine your final grade in the following way; if your final exam is a 90 or better, you will gain a letter grade, if the final exam is less than 60, you will drop a letter grade.

Homework You will be assigned homework every class period. The next class, the homework will generally be collected or a daily quiz based on the homework given. Your homework average will be used as bonus points (up to 10) for the exam covering that material.

Attendance Regular class attendance is expected. There will be no make-up for missed homework, so a missed day may result in a zero.

Calculators Calculators will generally not be allowed during exams.

Course Outline The following is a tentative outline of the material to be covered. I reserve the right to change the material and/or sequence.

Topics by Week

1) Sets, Functions, Binary Operations
2) Equivalence Relations, Modular Arithmetic
3) Permutations, Groups
4) Subgroups, Cyclic Groups
5) Basic Theorems, Test 1 (2.14)
6) Homomorphisms
7) Cayley's Theorem, Cosets
8) Quotient Groups
9) The Fundamental Theorem, Test 2 (3.20)
10) Rings
11) Ideals
12) Special Rings
13) Integral Domains, Fields
14) Finite Fields, Test 3 (4.24)
15) Review
16) Final Exam (5.4, 10:30-12:30)

General University Policies

Student Disability Services
ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA), and subsequent legislation.
The Office of Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student's responsibility to initiate such a request by contacting:

Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu

Title IX at Angelo State University:
Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. The University prohibits discrimination based on sex, which includes pregnancy, sexual orientation, gender identity, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination including: sexual assault, sex-based discrimination, sexual exploitation, sexual harassment, public indecency, interpersonal violence (domestic violence and/or dating violence), and stalking. As a faculty member, I am a Responsible Employee meaning that I am obligated by law and ASU policy to report any allegations I am notified of to the Office of Title
IX Compliance. This is done in order to connect students with resources and options in addressing the allegations reported. As a student, are encouraged to report any incidents of sexual misconduct directly to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator. You may do so by contacting:

Michelle Boone, J.D.
Director of Title IX Compliance/Title IX Coordinator
Mayer Administration Building, Room 210
325-942-2022
michelle.boone@angelo.edu

You may also file a report online 24/7 at www.angelo.edu/incident-form.

If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2173 or the ASU Crisis Helpline at 325-486-6345.

The Office of Title IX Compliance also provides accommodations related to pregnancy (such as communicating with your professors regarding medically necessary absences, modifications required because of pregnancy, etc.). If you are pregnant and need assistance or accommodations, please contact the Office of Title IX Compliance utilizing the information above.

For more information about Title IX in general you may visit www.angelo.edu/title-ix.

Student Absence for Observance of Religious Holy Days: A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. (http://www.angelo.edu/opmanual/ -- OP 10.19)

Incomplete Grade Policy: It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 Grading Procedures for more information.

Student Conduct Policies

Academic Integrity
Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.
The College of Science and Engineering adheres to the Statement of Academic Integrity

Plagiarism
Plagiarism is a serious topic covered in ASU’s Academic Integrity policy in the Student Handbook. Plagiarism is the action or practice of taking someone else’s work, idea, etc., and passing it off as one’s own. Plagiarism is literary theft. In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list. Papers are subject to be evaluated for originality via Turnitin. Resources to help you understand this policy better are available at the ASU Writing Center.

Copyright Policy
Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

General Policies Related to this Course: All students are required to follow the policies and procedures presented in these documents:
Angelo State University Student Handbook
Angelo State University Catalog

Student Learning Outcomes

1. The students will demonstrate factual knowledge including the mathematical notation and terminology used in this course. Students will read, interpret, and use the vocabulary, symbolism, and basic definitions used in abstract algebra, including binary operations, relations, groups, subgroups, homomorphisms, and rings.

2. The students will describe the fundamental principles including the laws and theorems arising from the concepts covered in this course. Students will develop and apply the fundamental properties of abstract algebraic structures, their substructures, their quotient structure, and their mappings. Students will also prove basic theorems such as Lagrange’s theorem, Cayley’s theorem, and the fundamental theorems for groups and rings.

3. The students will apply course material along with techniques and procedures covered in this course to solve problems. Students will use the facts, formulas, and techniques learned in this course to prove theorems about the structure, size, and nature of groups, subgroups, quotient groups, rings,
subrings, and the associated mappings. Students will also solve problems about
the size and composition of subgroups and quotient groups; the orders of
elements; and isomorphic groups and rings.

4. Students will develop specific skills, competencies, and thought
processes sufficient to support further study or work in this field or related
fields. Students will acquire a level of proficiency in the fundamental concepts
and applications necessary for further study in academic areas requiring abstract
algebra as a prerequisite or for work in occupational fields requiring a
background in abstract algebra.

**Course Content**

There is no textbook for this course. See the weekly topics (above) for a list of
the content to be covered.